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ABSTRACT

Several misconceptions regarding the status of human communication systems relative to the systems of other animals are discussed in this paper. Arguments are offered supporting the expansion of the communication discipline to include the study of the communication systems of other species. The "communicative continuity" view which ranks man at the top of a continuum of general animal intelligence, and the "speech superiority" view, which stresses that man's ability to speak makes him different from other animals, are analyzed. It is argued that once the fallacies of the "communicative continuity" and "speech superiority" positions are acknowledged--that man's sign systems are not at the apex of some straight-line continuum of evolution in communication--then it becomes apparent that there is no reason for limiting the study of communication to the communication of a single species. The remainder of the paper presents several additional reasons for including the communication of other animals in the study of communication and outlines the points that should be included in an evolutionary framework if it is to be accurate. (RB)

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Animal and Human Communication

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Animal and Human Communication

Although we call ourselves "communicologists," implying expertise in all sorts of communication systems, and frequently offer courses in "communication theory," implying the investigation of communication as a general phenomenon, the field of Speech Communication traditionally has been limited to the study of the communicative behavior of man. In part, this limitation reflects a continued reaffirmation of a conscious choice; and many undoubtedly still affirm this choice. In part, however, this limitation appears to be the result of several potent and restrictive misconceptions regarding the status of human communication systems relative to the systems of other animals. This paper discusses several of these misconceptions and offers arguments supporting the expansion of our discipline to include the study of the communication systems of other species.

The Scala Naturae

There exists a somewhat facitious maxim in some quarters of our field that "All things began with Aristotle." In actuality, Aristotle was the main source of a still prominent and influential view of man's place in the world. In De Anima, Aristotle proposed that various categories of animals could be placed along an ascending scale of completeness or perfection, culminating in man. Later scholars suggested that even animals within categories could be scaled, and, as Hodos and Campbell (1969: 338) indicated, "there came to be general acceptance of the concept that all animals could be ranked on a unitary, graded, continuous dimension known as the Scala Naturae or Great Chain of Being." The sponges and other formless creatures were located at the bottom of the scale; above them

were the insects, fish, amphibians, reptiles, birds, various mammals, the primates, and, finally, man. Each species possessed the powers of the others beneath it on the scale, plus an additional differentiating power of its own (White, Juhasz, and Wilson, 1973: 204).

Christian theologians eventually placed angels atop the scale, and man was envisioned as striving upwards on a ladder to heavenly perfection, motivated by a "divine spark." Under the influence of Cartesian dualism, "the criterion for Man's primacy over other animals shifted from his perfection to his rationality" (White, Juhasz, and Wilson, 1973: 205). Later, in mid-17th and 18th Century European philosophy, the rational and the divine were both attributed to man.

Misconception: Communicative Continuity

With the publication of Darwin's The Descent of Man (1871), the concept of the Scala Naturae split into two related but distinct branches, both of which have had some influence in our field. One branch followed the principle of "mental continuity," which asserted that species differed only quantitatively and could be ranked along a continuum of general intelligence, a view which The Descent of Man elaborated. By implication, as the scale was ascended, behavior became more complex, and the number of behavioral determinants increased.

The "mental continuity" view had two important auxilliary principles (Hodos and Campbell, 1969: 339): First, that the ranking of species according to intelligence reflected evolutionary history; and second, that there was a smooth continuity between living forms. Although this view proposed no qualitative superiority for man, his supremacy was assured by virtue of having more general intelligence than any other species: Man was seen as the most evolved creature (White, Juhasz, and Wilson, 1973: 206).

From the "mental continuity" perspective a communicologist would argue that communication systems could be arranged according to difficulty or complexity, corresponding to the positions of species on an evolutionary "scale." Such a position is evident in the biologically-oriented communication theory elaborated by Smith (1967). Although critical of nonqualitative, reductionistic mechanical models, and expounding a neg entropic view, Smith included an ordering of living systems (from sponges and other simple organisms to insects, lower vertebrates [fish, reptiles, and birds], higher vertebrates, and man) apparently to demonstrate the evolution of communicative complexity. This appears to be a direct application of the Scala Naturae to communication theory.

The assumptions of "mental continuity" or "communicative continuity" (Goetzinger and Rummel, 1973: 3) do not square with modern evolutionary theory in three important respects:

1. Modern theory recognizes that species differ qualitatively in morphology and behavior (including the mechanisms of behavior), as a result of natural selection and adaptation to different ecological demands. To say that man has more intelligence, or that his communication is more complex, completely fails to acknowledge differences in kind among systems that have evolved to meet varied adaptive requirements.

2. The ranking of species according to intelligence or communicative complexity does not reflect evolutionary history. Proponents of the "mental continuity" view apparently have confused the Scala Naturae, embodied today in something called the Phylogenetic Scale, with the Phylogenetic Tree. The Phylogenetic Tree, on the one hand, is a geneology, based on rough guesses and incomplete information, depicting the course of evolution of various species. It has nothing to say about the relative status of species in terms of any "gradational arrangement" (Hodos and

Campbell, 1969: 339). On the other hand, the Phylogenetic Scale (Scala Naturae) is an hierarchical ranking system, totally unrelated to specific evolutionary lineages, and utterly without scientific status (Hodos, 1970: 27). Species today represent divergent lines of evolution that long ago branched off, evolving in response to environmental requirements, and not representing any evolutionary sequence (Hodos, 1970: 27). No living species is descended from any other living species. Thus any ranking of species from sponge to lower vertebrates to higher vertebrates to man in terms of the evolution of communicative complexity has no scientific status.

This point may be illustrated by manipulating the superficial arrangement of the phylogenetic trees sketched below (Figures 1 and 2). In the first tree (Fig. 1), the left-to-right arrangement of the branches, in conjunction with a botton-to-top time perspective, increase the likelihood of perceiving the tree as a scale. Reversal of the branches (Fig. 2) does not alter the relationships among them or the time sequence; but the positions of the species on the presumed left-to-right hierarchy are radically changed.

Each species has a plurality of behaviors; and each of these behaviors and the mechanisms underlying them has a history of natural selection (Lockard, 1971: 171). The behaviors and mechanisms that are adaptive are preserved over time; those that are maladaptive are not. At any particular point in time, an animal is a "bundle of adaptations," with special behaviors and special abilities produced by natural selection (Lockard, 1971: 172).

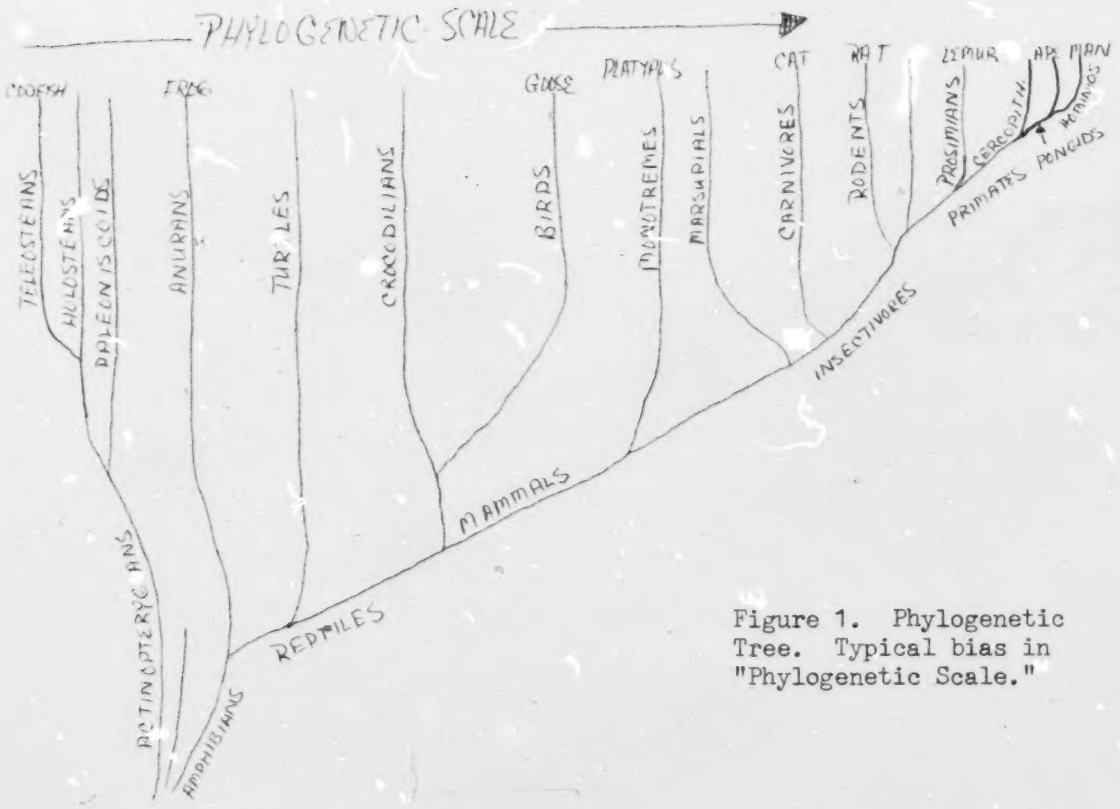

Figure 1. Phylogenetic Tree. Typical bias in "Phylogenetic Scale."

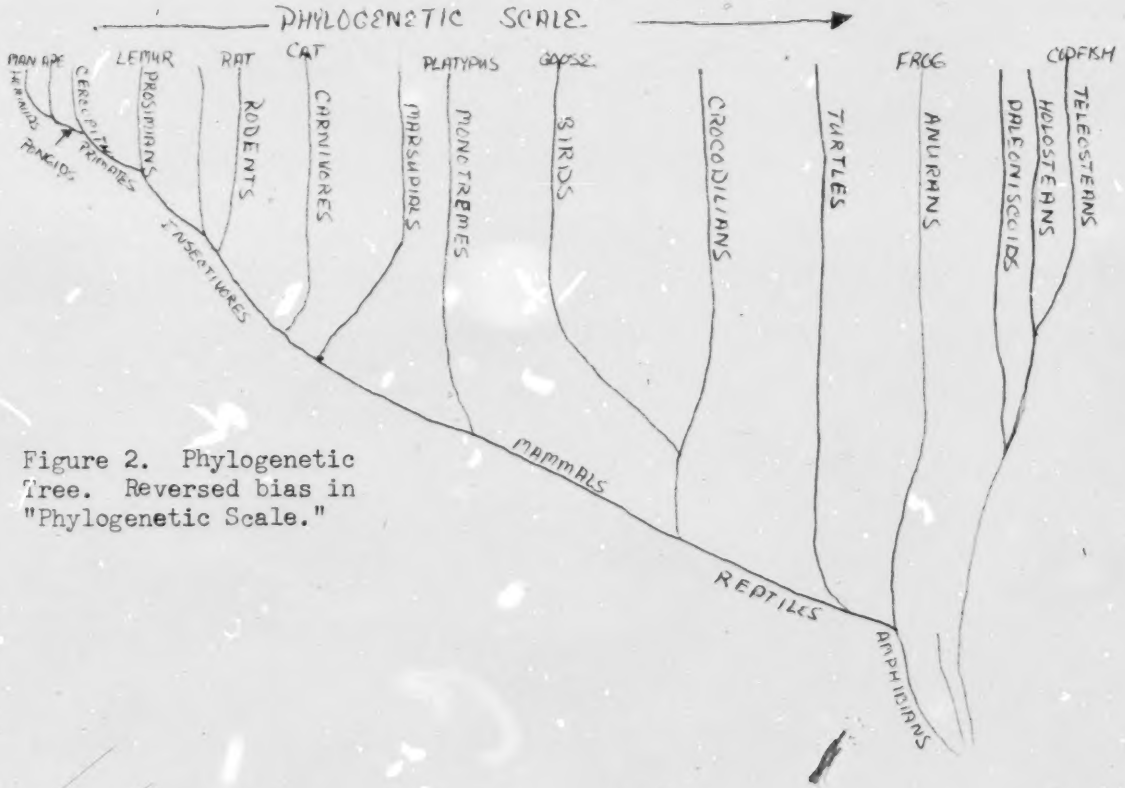

Figure 2. Phylogenetic Tree. Reversed bias in "Phylogenetic Scale."

Comparisons among species may be used to derive information about the evolution of behavior, or the adaptiveness of behavior. Behavioral similarities among related forms are assumed to be the result of phyletic closeness; differences in behavior among related forms are assumed to be the result of specialized adaptations to different modes of existence (Lockard, 1971: 172). These ideas are summarized in the "principle of phylogenetic relatedness:" "Behavioral homologies [similarity due to common ancestral origin] increase in frequency and detail among different animal species as proximity to a common ancestral species increases" (Lockard, 1971: 172). The complementary "principle of ecological convergence" states that similar (analogous) behavioral features may evolve in unrelated species as a result of similar ecological pressures (Lockard, 1971: 172).

The study of the evolution of any communication system involves the comparison of stem-related species (the "phylogenetic approach" [Hodos and Campbell, 1969: 343]). Reasonable inferences about the phylogenetic development of communication cannot be drawn from comparisons of animals representing divergent lineages. To trace the evolution of man's communication systems, the communication systems of hedgehogs, tree shrews, bushbabies, Old World monkeys, and chimpanzees might be compared. For example, van Hooff's (1972) investigation of the phylogeny of laughter and smiling in man focused on similar patterns of communicative behavior (the "relaxed open-mouth" display and the "silent bared teeth" display) in crab-eating monkeys, Celebes apes, chimpanzees, and man.

When working with the phylogenetic method, it must be borne in mind that the chosen species, as hopefully little-changed descendants of appropriate ancestors, merely represent the history of the lineage and are not ancestral themselves. Romer (1966) argued that Old World monkeys

and chimpanzees are reasonable enough representatives of man's ancestors that relatively meaningful conclusions about the evolution of man's behavior can be drawn; but these conclusions must always remain tentative and be drawn with care.

Questions about the adaptive significance of communicative behavior may be answered through comparisons of unrelated species subject to similar environments, or related species subject to dissimilar environments. Study of unrelated forms in dissimilar environments yields little comparative information.

Many of the current heated arguments about the symbolic capacity and behavior of nonhuman species (especially chimpanzees) can be seen to turn on the distinction between homologous and analogous behavior, and on the belief--or relative lack of belief--in the "principle of phylogenetic relatedness."* ('Homologous' implies phylogenetically related [i.e., fundamentally similar] underlying mechanisms. 'Analogous' indicates only superficial similarity.) Initially the dispute focused on whether the behavior of nonhuman species was analogous to human symbolic behavior (i.e., what Mistler-Lackman and Lachman [1974: 871] called "weak equivilence"). By all standard criteria,† chimpanzees clearly exhibit symbolic behavior. Now the dispute seems to be boiling down to whether the underlying neurological structures and processes are phylogenetically and ontogenetically the same ("strong equivilence" [Mistler-Lachman and Lachman, 1974: 871]). The "principle of phylogenetic relatedness"

*The "principle of phylogenetic relatedness" should not be confused with the notion of "mental" or "communicative continuity." The former affirms diversity by stressing that homologous behavior is likely only for species related by contiguous branches. The latter simply does not acknowledge the existence of branches.

†Arbitrariness (no necessary connection between sign and referent), semanticity (denotation), intensional (class) reference, creative usage, and the original development of unique signs.

provides some support for the assumption of fundamentally similar (though not necessarily identical) underlying mechanisms, since chimpanzees are phylogenetically quite close to man. However, opponents of this position argue that man and chimpanzee shared a common ancestor so long ago that many special abilities may have evolved since then (Lennenberg, 1968).

3. Finally, the communicative continuity view is inconsistent with modern evolutionary theory because there is no smooth continuity between living species. Because of the divergence of evolutionary lineages and the extinction of many intermediate forms, evolution is marked by dis-continuity. Living forms are not ancestral, but represent the temporary end products of divergent branches.

Misconception: Speech Superiority

The other branch of the Scala Naturae concept retained and extended the historical emphasis on qualitative differences among species. The notions of evolution were adapted to this view by distinguishing among various classes of human qualities: The "baser" instincts, which man shared with other animals, survived as remnants of man's rigid, animalistic past; but other qualities--intelligence, rationality, culture, or symbolic ability (especially language) -- set man above and apart. Man was distinguished by his "badge of excellence," which White, Juhasz, and Wilson (1973: 207) recognized as a kind of unconsciously and fervently accepted "vestigial divine spark." An auxilliary tenet of this view was

that man was the inevitable goal of evolution (that, in effect, evolution terminated with modern man).

As with the communicative continuity position, the tenets of the qualitative superiority, or "speech superiority" (Goetzinger and Rummel, 1973: 4) position do not fit with evolutionary theory in several respects:

1. The "speech superiority" position depends on the erroneous Phylogenetic Scale, rather than the Phylogenetic Tree. The Tree is neither unitary nor linear, and does not culminate in man. It is not a ranking system.

2. While this position correctly emphasizes the existence of qualitative differences among species, the "speech superiority" view expresses a standard that is biased and self-serving. There is no natural or non-subjective justification for this. This position not only disregards evolutionary history by accepting a single-lineage view, but also totally fails to recognizes the unique qualities of other species which quite adequately prepare them for life in particular environments. It would make as much sense to rank all species according to type of body covering (e.g., fur, hair, shell), as indicating an evolutionary progression, ignoring the environmental conditions to which each kind was adapted. White, Juhasz, and Wilson (1973: 210) suggested that a superiority position reflects a general tendency to treat differences as inferior and primitive. Anthropocentricism in the comparative study of communication systems has as much validity as chauvinism in cross-cultural work.

The "speech superiority" view survives today, usually as a set of unarticulated attitudes. Occasionally, however, these attitudes surface, as in a recent article discussing communication as a biosystem (Williams and Pearce, 1974). Williams and Pearce asserted that the "human infor-

mation system is biologically unique" in that "critical content is not coded and transferred genetically" (p. 13). Rather, man's information system is culture, and culture is based on man's "unique" symbolic abilities. Human cooperative activity, which is the basis for human biological success, is made possible through culture (p. 13). The information systems of animals, they asserted, are genetically determined (pp. 13-14): hence, the "animal model" of cooperative activity depends solely on genetically determined physical characteristics (p. 14).

The assumptions underlying Williams and Pearce's assertions appear to be the following:

1. The Animal Kingdom can be divided into two camps.
2. Man is animal-plus.
3. All nonhuman species are fundamentally the same (the "animal model").
4. The behavior of nonhuman animals is fully genetically programmed.
5. Learning is absent, or, at most, limited to inconsequential matters in nonhuman species.
6. Only man has culture.
7. Only man displays symbolic behavior.
8. Culture and symbolic behavior are the natural (i.e., unquestionable) standards for the comparison of species and the determination of specie-superiority.

The fallacy of many of these points in light of current theory and knowledge of evolution has been discussed already. The ignorance displayed in these assumptions should also be pointed out. For example, the list of species exhibiting cultural behavior (i.e., cross-generation transmission of acquired information) is enormous, and is composed of species as diverse as Olive baboons (Strum, 1975) and white-crowned sparrows (Marler and Tamura, 1962). In many cases, the culturally-transmitted information appears critical to the survival of the species and appears to serve general biological functions (e.g., facilitation of adaptation to local environmental conditions). "Protocultural" transmission (across successive groupings) has also been found (e.g., in groups of chimpanzees

/Menzel, Davenport, and Rogers, 1972/). The development of traditions requires considerable plasticity; but this is not to say that seemingly analogous behavior is exactly the same or built upon homologous abilities. Vast qualitative differences in learning abilities have been found for many species (cf. Rozin and Kalet, 1971; Shettleworth, 1972). Although the issue of symbolic behavior was mentioned earlier in this paper, it should be noted that clear examples of the symbolic use of signs selected by the species rather than the human experimenters are abundant. For example, Mason and Hollis (1962) found that paired rhesus monkeys developed arbitrary signals with shared "meanings," enabling one member of the pair to pull a lever that gave rewards to both monkeys. Menzel (1971) found that a leader chimpanzee communicated the quality and location of an hidden object to his group by extremely subtle signals that even highly trained observers had difficulty discerning. As Hinde (1974: 103) remarked, these experiments "have opened up possibilities /of/...subtleties of communication processes that were previously hardly suspected." Again, this is not to say that analogous behavior results from the same underlying mechanisms: Undoubtedly various and different abilities are involved in symbolic behavior. However, it is the nature of such differing abilities that is of profound interest--not the self-congratulatory and naive assertion of superiority due to man's "unique" cultural information system.

Expansion of the Discipline

Once the fallacies of the "communicative continuity" and "speech superiority" positions are acknowledged, and it is recognized that man's sign systems are not at the apex of some straightline evolution in communication, then it becomes apparent that there is no non-arbitrary reason for limiting our study of communication to the communication of a single

species. In fact, there are several profoundly important reasons for expanding our subject pool:

1. In the first place, once the likelihood of diversity and qualitative differences among the communication systems of other species is recognized, then it becomes evident that we cannot understand communication (i.e., we can have no general theory) by studying only the communication of a single species (a sample of One, as Sebeok [1968] said).

2. Second, although we may wish to refrain from developing general theory and focus only on "anthroposemiotic" (i.e., unique to man) communication (Sebeok, 1963), we cannot do so without first defining what is uniquely human. But without knowledgeable reference to the communication systems of other species, we cannot identify the species-specific aspects of human communication. Further, such a restriction in focus would require the neglect of many aspects of human communicative behavior which we now study (e.g., kinesics, proxemics) that do not appear to be species-specific. Justification of such neglect would seem to require the assumption that anthroposemiotic systems stand alone, independent of paralinguistic, kinesic, or proxemic systems, and can be understood apart from them--clearly an untenable assumption. Once we accepted the study of human nonverbal communication, we implicitly moved into the study of "zoosemiotics" (Sebeok, 1963).*

3. And third, without comparative work, we cannot answer fundamental questions about the evolution and adaptive significance of human communication.

If we want our discipline to be more than a collection of results from empirical studies, and to be based on a durable foundation, then the communication systems of man must be studied and understood within an

*See W. J. Smith (1974) for an excellent discussion of current trends and issues in zoosemiotics.

evolutionary framework. An evolutionary framework includes the following four points:

1. The communication process is not unitary or one-dimensional within or across species. It is not the same in all species; and all nonhuman species cannot be lumped together. There is no phylogenetic scale.

2. The communication process, as manifested in qualitatively different abilities and behaviors, is subject to complex selection pressures. Communicative abilities and behaviors are adaptive.

3. Similar behaviors and abilities in related species are likely to be the result of phylogentic closeness; similar behaviors and abilities in unrelated species are likely to be due to similar environmental pressures. Differences among the communication systems of various species may be the result of either evolutionary divergence or difference adaptive pressures.

4. Discontinuity and divergence mean great and exciting qualitative differences among systems. Man's communication systems are not uniquely special--they are just special.

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